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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,236	09/20/2001	Bulent M. Basol	042496/0269299 NT-209(U)	5866
20995	7590	01/04/2006	EXAMINER ZHENG, LOIS L	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			ART UNIT 1742	PAPER NUMBER

DATE MAILED: 01/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,236

Applicant(s)

BASOL ET AL.

Examiner

Lois Zheng

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 and 36-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18,20,33,41 and 43 is/are allowed.
- 6) ☒ Claim(s) 1-17, 19, 21-32, 34-40, 42 and 44-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-33 and 36-52 are currently under examination.

Note, in Fig. 14, numeral 50 should be changed to 500.

Status of Previous Rejection

2. Applicant's arguments, see pages 12-13, filed 15 December 2005, with respect to Uzoh et al. US 6,413,388 have been fully considered and are persuasive. The rejections of claims 1-33 and 36-52 have been withdrawn. The finality of the previous Office Action is withdrawn.

However, upon further search and consideration, a new ground(s) of rejection is made in view of Uzoh US 6,066,030(Uzoh'030).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 22 recites the limitation "the slit" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 6-9, 13-15, 21-24, 27-28, 31-32 and 51-52 are rejected under 35

U.S.C. 103(a) as being unpatentable over Emesh et al. US 2002/0108861 A1(Emesh) in view of Uzoh US 6,066,030(Uzoh).

Emesh teaches an electrochemical planarization apparatus comprising a polishing pad(abstract).

Regarding instant claim 1, Emesh teaches, in Fig. 9, the claimed pad(Fig. 4 numeral 40) for polishing having the claimed top and bottom surfaces, claimed channels (i.e. known as grooves in Emesh, Fig. 9 numeral 120), and claimed holes within the channels(i.e. known as apertures in Emesh, numeral 210). Emesh also teaches that the polishing pad can move in a rotational, orbital or linear pattern(page 5, paragraph 55). Emesh further teaches that the wafer carrier pushes the wafer against the polishing pad(page 54 paragraph 54). Therefore, Emesh meets the claim limitation of the relative movement and physical contact between the pad and substrate.

However, Emesh does not explicitly teach the claimed feature of "a width of the at least one channel varies along a length of the at least one channel" as recited in instant claim 1.

Uzoh'030 teaches an electropolishing apparatus comprising a polishing pad(Fig. 2 numeral 19), wherein the polishing pad further comprises distribution gaps that radiates in a curve away from the central region of the polishing pad(Fig. 2 numeral 21).

Fig. 2 of Uzoh'030 appears to show that the width of the distribution gaps varies along the length of the distribution gaps.

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the distribution gaps of Uzoh'030 into the polishing pad of Emesh in order to enhance the distribution of electrolyte as taught by Uzoh'030(col. 3 lines 36-48).

Regarding instant claim 1, the distribution gap of Emesh in view of Uzoh'030 reads on the claimed channels, wherein the widths of the channels vary along the lengths of the channels. Therefore, the channels of Emesh in view of Uzoh'030 extend across the pad, therefore, are inherently capable of allowing the electrolyte solution to flow there through and out of the channel as claimed.

Regarding instant claim 24, the instant claim is rejected for the same reason as stated in the rejection for instant claim 1 above. In addition, since the apparatus of Emesh in view of Uzoh'030 is used for electropolishing, the claimed electrical potential receiving terminal and the claimed at least one electrical contact would have been inherently present in order for the electropolishing apparatus to be operational. Furthermore, since the channels of Emesh in view of Uzoh'030 are shaped to enhance the distribution of the polishing solution, the channels of Emesh in view of Uzoh'030 inherently meet the claim limitations of allowing "a substantially equal amount of processing to occur on a center region of the workpiece and the edge region of the work piece" as recited in instant claim 24.

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Regarding instant claim 2, the channels of Emesh in view of Uzoh'030 is disposed radially from the center portion of the pad to the edge portion of the pad as claimed.

Regarding instant claim 3, Fig 9 of Emesh shows a plurality of holes(numeral 210) disposed in the electrolyte channels(numeral 120) between the top and bottom surfaces of the pad. Therefore, in light of the teachings of Uzoh'030, Emesh in view of Uzoh'030 disclose the claimed holes with the channels as claimed.

Regarding instant claims 7, 9, 13, 27 and 31-32, the instant claims are rejected for the same reason as stated in the rejection for claims 1-3 above.

Regarding instant claims 6 and 8, the channels of Emesh in view of Uzoh'030 are V shaped, based on the broadest reasonable interpretation, as claimed.

Regarding instant claims 14 and 28 of, Emesh further teaches that the channels on polishing pad has channels that are parallel to each other(Fig. 9) as claimed.

Regarding instant claims 15, 21-22 and 29, Emesh further teaches the claimed slit(i.e. known as windows in Emesh, Fig. 9 numeral 220) disposed in the channels as claimed .

Regarding instant claim 23 of, Emesh further teaches that the pad material may be formed of abrasive material(page 4, paragraph 44).

Regarding instant claim 51, the width of the radially extending grooves as taught by Emesh in view of Uzoh'030 is reduced as the channels extend towards the edge channel portion as claimed.

Regarding instant claim 52, even though Emesh in view of Uzoh'030 do not explicitly teach the claimed increasing channel width as the at least one channel extends toward the edge channel portion, one of ordinary skill in the art would have found the claimed feature of increasing channel width as the at least one channel extends toward the edge channel portion an obvious design choice absent persuasive evidence that particular channel configuration is significant. See MPEP 2144.04(IV). In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

8. Claims 4-5, 10-12, 17, 19, 36-40, 42 and 44-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'030, and further in view of Uzoh et al. US 6,261,426 B1(Uzoh'426).

The teachings of Emesh in view of Uzoh'030 are discussed in paragraph 7 above. However, Emesh in view of Uzoh'030 do not specifically teach the claimed plurality of holes dimensioned to provide greater flow at the edge portion of the pad than in the central portion of the pad as claimed.

Uzoh'426 teaches an electrodeposition or electroetching system comprising a baffle between the inlet flow and the substrate(Fig. 1 numeral 8). Uzoh'426 further teaches that the baffle includes larger openings at the center of the baffle and smaller openings at the edge of the baffle(Fig. 2-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the various size openings of Uzoh'426 into the holes of the polishing pad channels of Emesh in order to improve the uniformity of the deposited or the etched coating layer as taught by Uzoh'426.

Regarding instant claims 4-5 and 10-11, even though Emesh in view of Uzoh'030 and Uzoh'426 only teaches the larger openings at the center portion of the pad and smaller openings at the edge of the baffle in order to direct more current flow toward the center of the substrate, one of ordinary skill in the art would have found the claimed larger size holes in edge portion of the pad and smaller size holes at the center portion of the pad obvious since larger size holes obvious since Uzoh'426 teaches the size of openings can be varied to better control the fluid flow and distribution.

Regarding instant claim 12, Emesh further teaches the claimed slit(i.e. known as windows in Emesh, Fig. 9 numeral 220). The slits that are located in the center area of the pad have two opposite sides parallel to the edges of the channel. Since Emesh does not explicitly disclose the width of the slits, based on the broadest interpretation, the examiner concludes that the slits of Emesh in view of Uzoh'030 and Uzoh'426 are narrow enough to read on the claim limitation of "other opposite sides having a shape corresponding to a radius from a corresponding center portion of the pad" as recited in instant claim 12.

Regarding instant claim 17, the larger size channel holes in the center portion of the pad of Emesh in view of Uzoh'030 and Uzoh'426 are inherently capable of allowing larger amount or processing to occur at the center region of the workpiece than the edge region of the workpiece as claimed.

Regarding instant claim 19, the larger size channel holes at the edge portion of the pad of Emesh in view of Uzoh'030 and Uzoh'426 are inherently capable of allowing

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larger amount of processing to occur at the edge region of the workpiece than the center region of the workpiece as claimed.

Regarding instant claim 36, the apparatus of Emesh in view of Uzoh'030 and Uzoh'426 having different hole sizes at the center and edge portions of the pad meets limitations of producing "greater amount of processing to occur on one region of the workpiece than another region of the workpiece". The claim is also rejected for the same reason as stated in the rejection of instant claim 1 above.

Regarding instant claim 39, the holes in the pad channels of Emesh in view of Uzoh'030 and Uzoh'426 are inherently capable of allowing the solution to flow through the channels of Emesh in view of Uzoh'030 and Uzoh'426 when the pad is in contact with the workpiece as claimed.

Regarding instant claims 37-38, 40 and 42, the apparatus of Emesh in view of Uzoh'426 having different hole size at the center and edge portions of the pad inherently creates claimed center and edge region of the workpiece as claimed.

Regarding instant claim 44, the channels of Emesh in view of Uzoh'030 and Uzoh'426 has a gradually changing width between a center portion of the pad and the edge portion of the pad as claimed.

Regarding instant claims 45-46, the center and edge regions as taught by Emesh in view of Uzoh'030 and Uzoh'030 read on the center and edge regions as claimed.

Regarding instant claims 47-49, the instant claims are rejected for the same reasons as stated in the rejections of instant claims 6, 14-15 in paragraph 7 above.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'030, and further in view of Basol et al. US 2002/0134748 A1(Basol).

The teachings of Emesh in view of Uzoh'030 are discussed in paragraph 7 above. However, Emesh in view of Uzoh'030 do not explicitly teach the claimed slit extends part the edge region of the workpiece as recited in the instant claim 16.

Basol teaches an apparatus for electrochemical mechanical processing(abstract) comprising a shaping plate or belt as a workpiece surface influencing device(page 3, paragraph 35, page 6, paragraphs 53-56).

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the polishing pad of Emesh in view of Uzoh'030 since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35).

Regarding instant claim 16, Emesh in view of Uzoh'030 and Basol teaches a rectangular polishing plate or belt with the claimed channels, holes and slits. Since the polishing plate or belt of Emesh in view of Uzoh'030 and Basol is longer than the diameter of the workpiece wafer (Basol, Fig. 11A-B, Fig. 12A-B), the slits of the polishing plate or belt of Emesh in view of Uzoh'030 and Basol inherently extends past the edge portion of the workpiece allowing the electrolyte to flow therethrough and out of the channels when contacting the workpiece as claimed.

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'030, and further in view of Uzoh et al. US 6,612,915(Uzoh'915).

The teachings of Emesh in view of Uzoh'030 are discussed in paragraph 7 above. However, Emesh in view of Uzoh'030 do not explicitly teach the claimed at least two electrical contacts as recited in instant claim 25.

Uzoh'915 teaches a workpiece holder comprising an electrical contact ring with plurality of contact members as shown in Fig. 6a.

Therefore, one of ordinary skill in the art would have incorporated the electrical contact ring with plurality of contact members as taught by Uzoh'915 into the apparatus of Emesh in view of Uzoh'030 in order to provide uniform current distribution as taught by Uzoh'915.

11. Claims 26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'030 and Uzoh'915, and further in view of Basol.

The teachings of Emesh in view of Uzoh'030 and Uzoh'915 are discussed in paragraph 10 above.

However, Emesh in view of Uzoh'030 and Uzoh'915 do not explicitly teach the claimed rectangular shaped mask plate as recited in instant claim 26.

The teachings of Basol are discussed in paragraph 9 above.

Regarding instant claim 26, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the polishing pad of Emesh in view of Uzoh'030 and Uzoh'915 since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35). In addition, since the width of the shaping plate or belt of Emesh in view of Uzoh'030, Uzoh'915 and Basol is smaller than the diameter of the

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workpiece wafer (Basol, Fig. 11A-B, Fig. 12A-B), the plurality of electrical contact members of the contact ring of Emesh in view of Uzoh'030, Uzoh'915 and Basol inherently meet the claim limitation of "at least two electrical contacts disposed on opposite sides of the mask plate".

Regarding instant claims 29 and 30, the claims are rejected for the same reason as stated in the rejection of instant claim 16 above.

12. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'030 and Uzoh'426, and further in view of Basol.

The teachings of Emesh in view of Uzoh'030 and Uzoh'426 are discussed in paragraph 8 above. However, Emesh in view of Uzoh'030 and Uzoh'426 do not explicitly teach the claimed slit extends part the edge region of the workpiece as recited in the instant claim 50.

The teachings of Basol are discussed in paragraph 9 above.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the polishing pad of Emesh in view of Uzoh'030 and Uzoh'426 since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35).

Regarding instant claim 50, the claim is rejected for the same reason as stated in the rejection of instant claim 16 above.

Allowable Subject Matter

13. Claims 18, 20, 33, 41 and 43 are allowed.

Response to Arguments

14. Applicant's arguments with respect to Uzoh et al. US 6,413,388 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

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